A 73-Year-Old Man With Chest Pain 4 Days After a Fish Dinner*

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*(CHEST 2004: 126:294–297)

A 73-year-old man with a medical history significant for hypertension, smoking, and dyslipidemia presented to the emergency department complaining of chest pain. Symptoms had begun 4 days prior to hospital admission, and consisted of a sharp, substernal pain, starting shortly after a meal, and progressing gradually over the next 72 h. The pain radiated to the patient’s left shoulder and scapula, and was pleuritic. Eventually, the patient experienced dyspnea and near-syncope. The medical history was unremarkable.

Physical Examination

On physical examination, the patient appeared restless. His BP was 115/75, pulse was 72 beats/min and regular, respiratory rate was 14 breaths/min, and oral temperature was 36.5°C. His examination on hospital admission revealed jugular venous distention and decreased breath sounds over both lung bases, without adventitious sounds. The chest pain could not be reproduced with palpation. Heart sounds were distant, and peripheral pulses were normal. The remainder of the examination findings was normal.

Laboratory Data and Radiographic Findings

The ECG performed on hospital admission showed asymmetric T-wave inversions in V1 and V3, with 1-mm concave ST-wave elevation in the lateral and inferior leads.

The initial creatinine phosphokinase concentration was 670 ng/mL (normal reference range, 30 to 220 ng/mL), the MB isoform fraction was 18 ng/mL (normal reference range, < 8.8), and troponin T concentration was 31 ng/mL (normal reference range, < 0.10). The WBC count was 19,000 cells/µL with 90% neutrophils. The chest radiograph obtained on hospital admission demonstrated right pleural effusion (Fig. 1). A chest CT scan (Fig. 2) was obtained as well.

Hospital Course

A transesophageal echocardiogram ruled out aortic dissection. However, it revealed a pericardial effusion of moderate size. Left and right ventricular function were normal, and there was no apparent valvular disease. The patient was admitted to the coronary ICU and received treatment for acute coronary syndrome. His symptoms gradually worsened, and he developed hypotension. A follow-up echocardiogram revealed enlargement of the pericardial effusion and collapse of the right heart chambers consistent with tamponade.

What was the cause of this man’s deterioration?

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Manuscript received July 22, 2003; revision accepted October 3, 2003.

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Figure 1. A chest CT scan showed bilateral pleural effusions with bilateral atelectasis, and pericardial effusion. No other abnormality was noticed.

Figure 2. A chest CT scan showed bilateral pleural effusions with bilateral atelectasis and pericardial effusion. No other abnormality was noticed.
Diagnosis: Cardiac tamponade caused by esophageal perforation by a fish bone with injury to the pericardium and right ventricular myocardium.

Discussion

Esophageal perforation is a rare condition that has a mortality rate of about 22%. The most common causes are diagnostic or therapeutic procedures performed by physicians. Spontaneous esophageal rupture (Boerhaave syndrome) is responsible for about 15% of cases. Even less frequently, esophageal perforation may be caused by a foreign body. The high mortality in this condition results from the lack of clinical suspicion and the late initiation of treatment.

The pathophysiology of the perforation is explained by the initial impaction of the foreign body, which in this particular case was a fish bone (Fig. 3), in the esophageal mucosa and by the subsequent local, inflammatory phenomena with necrosis due to direct pressure. The success of treatment, therefore, depends on a careful history, meticulous physical examination, and chest radiographic findings.

With this foreign body, typical patient complaints are odynophagia and dysphagia. After reviewing the patient’s symptoms again, it was discovered that on the same day as the onset of symptoms he had eaten a fish meal and 3 h later went for a walk. The event occurred during Holy Week, in which Catholics can only eat fish. However, in the present patient the typical GI complaints of esophageal perforation were absent, and the tract of the foreign body was unusual. After perforating the esophagus, the fishbone moved anteriorly, bypassing the aorta, perforating the pericardium, and injuring the right ventricular myocardium. Therefore, the elevated cardiac enzyme levels were secondary to mechanical trauma of the myocardium and not to an ischemic event. The literature reports seven cases of esophagopericardial fistulas, with two occurring because of fish bones. More than 100 cases of aortoesophageal fistulas have been reported to have an association with esophageal perforation by fish bones. Because of the patient’s risk factors, elevated troponin levels, and abnormal ECG findings, the initial impression was acute coronary syndrome with post-myocardial infarction pericarditis. Once the transesophageal echocardiogram did not demonstrate acute aortic dissection, the patient received treatment with aspirin, anticoagulation, β-blockers, and nitroglycerin. This treatment interfered with the coagulation pathways and ultimately led to cardiac tamponade.

Myocardial infarction with perforation of the ventricular free wall should be one of the first diagnoses considered. With the patient’s cardiovascular risk factors, an acute coronary syndrome also should be considered, particularly with elevated cardiac enzymes. The development of cardiac tamponade raises the suspicion of a free wall rupture. However, free wall rupture is typically preceded by a transmural infarction, and the development of tamponade is abrupt. Since the echocardiogram indicated normal left ventricular function and the development of tamponade was gradual, cardiac rupture is unlikely in this case.

Acute pericarditis also can be compatible with the patient’s symptoms. However, he denied recent febrile episodes or a viral syndrome. Neutrophilia as opposed to lymphocytosis argues for the presence of pericarditis because of its usual viral origin. However, this was a possibility, especially over the next 72 h after the acute event, and was suggested by the ECG findings. Pericarditis with secondary tamponade is uncommon.

Aortic dissection always should be considered in a patient with hypertension and acute chest pain who precipitously becomes hypotensive and develops a pericardial effusion. A negative transesophageal echocardiogram finding at hospital admission virtually excluded the diagnosis.

Pneumothorax should be considered when acute hypotension develops in a patient after central line insertion. A pericardial effusion is not seen with pneumothorax, although both conditions can coexist.

The patient finally was taken to the operating room with diagnosis of cardiac tamponade. He had a pericardiotomy, and 800 mL clotted blood was drained. A fish bone was found on the pericardium adherent to the right ventricle.

Fish bone perforation is associated with a high degree of contamination, however, the fluid drained was not purulent. Although the patient had marked leukocytosis at hospital admission and fever was
present 3 days postoperatively, he did not develop bacteremia or septic shock. The patient received broad-spectrum antibiotics, and blood culture findings remained negative. Although a thoracentesis and pleural fluid analysis (with high amylase and low pH) would have narrowed the differential diagnosis, events progressed rapidly, and they were not an option in this patient.

Postoperatively, an esophago-gastro-duodenoscopy was performed and showed no evidence of perforation. The patient was discharged home in stable condition 11 days after the hospital admission.

**Clinical Pearls**

1. The ingestion of fish bones is a frequent complaint. Its main complications are airway obstruction and esophageal trauma. A careful history and chest radiograph are important in establishing an early diagnosis.

2. When fish bone ingestion is complicated by esophageal perforation, the main cardiovascular complication is aortic perforation, which leads to hypotension from hemothorax. Hematemesis can occur if an aortoesophageal fistula is present.

3. Acute coronary syndrome is a common condition and is associated with cardiac enzyme elevation.

4. On rare occasions, a foreign body (like a fish bone) can follow an atypical tract and not be detected by chest radiograph or CT scan. It may mimic acute myocardial infarction and with treatment lead to complications, such as cardiac tamponade.

**Selected Readings**


Sharland MG, McCaughan BC. Perforation of the esophagus by a fish bone leading to cardiac tamponade. Ann Thorac Surg 1993; 56:969–971


However, many other conditions such as pericarditis, myocarditis, pulmonary embolism, cardiac contusion, cardiac trauma, and renal insufficiency can have a similar presentation with concomitant cardiac enzyme elevation.

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